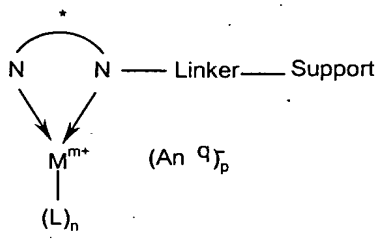
WHAT IS CLAIMED IS:

1. Compounds of the formula (I)



(I)

where

is an enantiomerically enriched chiral nitrogen compound,

Linker is a radical which is bonded both covalently to the enantiomerically enriched chiral nitrogen compound and to the support,

Support is a micro-, meso- or macroporous support material,

(M^{m+}) is a metal having valency m

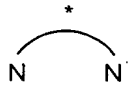
L is an anionic or uncharged ligand

n is one, two, three or four

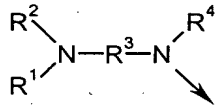
(An^{q-}) is an anion having valency q and

p is (m – number of anionic ligands L)/q.

2. Compounds according to Claim 1, characterized in that



is an enantiomerically enriched chiral nitrogen compound of the formula (II)



(II)

where

the arrow indicates the bonding point to the linker and

R^1, R^2 and R^4 are each independently hydrogen, C_1-C_8-alkyl, C_5-C_{15}-arylalkyl or C_4-C_{14}-aryl or NR^1R^2 as a whole is a cyclic amino radical having a total of 4 to 20 carbon atoms,

R^3 is a divalent radical having 2 to 30 carbon atoms or

R^3 and at least one of the radicals R^1, R^2 and R^4 together are part of a cyclic amino radical having a total of 4 to 20 carbon atoms.

3. Compounds according to Claim 2, characterized in that R^1, R^2 and R^4 are each independently hydrogen, C_1-C_8-alkyl, C_5-C_{15}-arylalkyl or C_4-C_{14}-aryl or NR^1R^2 as a whole is a 5- or 6-membered monocyclic amino radical which is optionally mono-, di-, tri- or tetrasubstituted on the carbon framework by C_1-C_4-alkyl and

R^3 is a divalent radical which is selected from the group of C_2-C_8-alkylene which may optionally be further mono- or diubstituted by C_4-C_{14}-aryl radicals, C_5-C_{15}-arylalkylene, C_4-C_{14}-arylene or bis(C_4-C_{14}-arylene) or

R^3 and one of the radicals R^1, R^2 and R^4 together are part of a 5- or 6-membered monocyclic amino radical which is optionally additionally mono-, di-, tri- or tetrasubstituted on the carbon framework by C_1-C_4-alkyl.

4. Compounds according to Claim 1, characterized in that the support is a micro- or mesoporous support material.

5. Compounds according to Claim 1, characterized in that the supports are silica gels or zeolites of the MOR, X, Y, MCM, ZSM, FAU, MFI, L, BEA, FER, A and SBA type or those of the AlPO, MAlPO and SAPO type, and the zeolites are optionally isomorphically substituted.

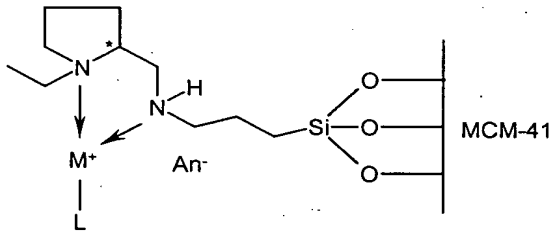
6. Compounds according to Claim 1, characterized in that supports are mesoporous zeolites.

7. Compounds according to Claim 1, characterized in that (M^{m+}) is cobalt in the formal oxidation states 0, +2 and +3, rhodium and iridium in the formal oxidation states +1 and +3, nickel, palladium and platinum in the formal oxidation states 0 and +2 or ruthenium in the formal oxidation state +2.

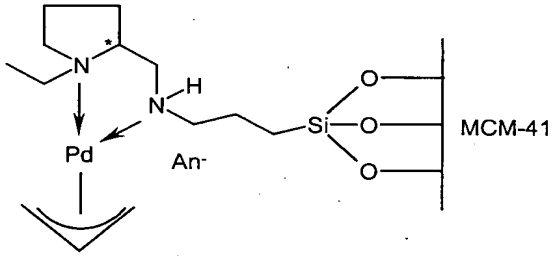
8. Compounds according to Claim 1, characterized in that L is the following types of ligand: monoolefins, diolefins, nitriles, aromatics or anionic ligands.

9. Compounds according to Claim 1, characterized in that (An $^{q-}$) is nitrate, perchlorate, sulphate, hexafluorophosphate, hexafluoroantimonate, hexachloroantimonate, borates or sulphonates.

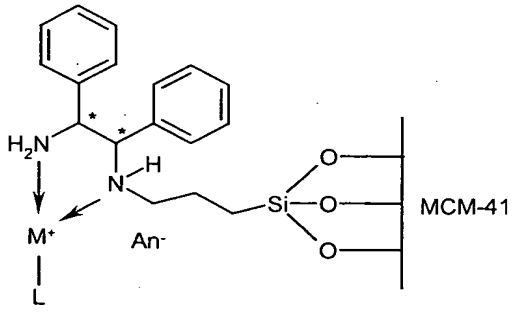
10. Compounds according to Claim 1, characterized in that they are of the formulae (Ia), (Ib), (Ic) and (Id)



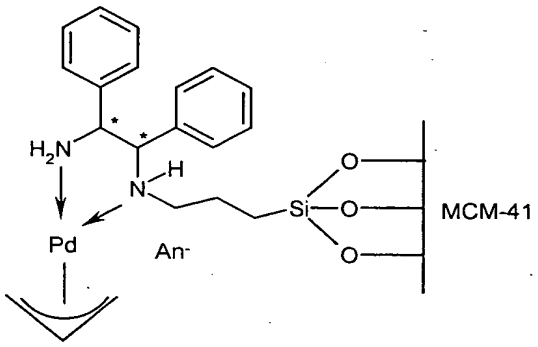
(Ia)



(Ib)



(Ic)



(Id)

where, in each case,

* marks a stereogenic centre which is either R- or S-configured, with the proviso that mesoforms are excluded (compounds of the formula (Ic) and (Id))

M^+ is rhodium^I or iridium^I and

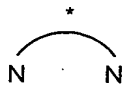
L is cod or nbd and

An^- is perchlorate, hexafluorophosphate, trifluoromethanesulphonate or tetrafluoroborate.

11. Compounds of the formula (V)

(V)

where



is an enantiomerically enriched chiral nitrogen compound,

Linker — is a radical which is bonded both covalently to the enantiomerically enriched chiral nitrogen compound and to the support,

Support — is a micro-, meso- or macroporous support material which is modified by the linker.

12. Catalysts comprising compounds according to Claim 1.

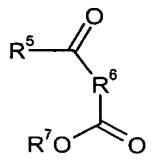
13. A process for conducting asymmetric reactions comprising catalyzing the reactions with compounds of Claim 1.

14. Process for catalytically preparing enantiomerically enriched compounds, comprising catalyzing the preparation with the compounds according to Claim 1.

15. Process according to Claim 14, characterized in that processes for preparing enantiomerically enriched compounds are asymmetric hydrogenations.

16. Process according to Claim 14, characterized in that asymmetric hydrogenations are hydrogenations of α- and β-ketocarboxylic esters.

17. Process according to Claim 16, characterized in that α- and β-ketocarboxylic esters are those of the formula (VII)



(VII)

where

R^5 and R^7 are each independently C_1-C_{12}-alkyl, C_1-C_{12}-haloalkyl, C_5-C_{15}-arylalkyl or C_4-C_{14}-aryl and

R^6 is absent or is 1,1-(C_1-C_4-alkylene).

18. Process according to Claim 15, characterized in that the reaction temperature in the case of asymmetric hydrogenations is 0 to 200°C and the partial hydrogen pressure is 0.1 to 200 bar.

19. Process according to Claim 15, characterized in that solvents selected from the group consisting of aliphatic or aromatic, optionally halogenated, hydrocarbons, ethers and alcohols are used in the process.

20. Process according to Claim 14, characterized in that the weight ratio of compounds to substrate is 1:1 to 1:10 000.

21. A process for preparing optical resolution reagents comprising providing compounds which have been prepared by a process according to Claim 14.

22. A process for preparing agrochemicals or pharmaceuticals comprising providing compounds which have been prepared by a process according to Claim 14.